

SUMMARY OF REPORT ON JOINT FAA/INDUSTRY TAKEOFF  
NOISE ABATEMENT WORKING GROUP

**PROBLEM:** Because of unique runway/community situations and varying performance and noise characteristics of different aircraft, there have been increasing pressures to use nonstandard or special takeoff noise abatement procedures. The lack of standardization generally has a negative effect on safety. Although a nonstandard procedure may not have a significant effect when considered alone, potentially there is a negative effect on safety when these procedures vary from airport to airport and aircraft to aircraft. There is a need to address these potentially negative effects and to ensure that adequate safety levels are maintained. The attachments to this summary report on the activities and recommendations of the joint FAA/Industry working group that was formed to address this problem.

**ORGANIZATION OF THIS REPORT:** This report is organized in a series of attachments as follows:

- . Attachment 1 contains the minutes of the working group's meetings. The minutes are presented first as they provide some background for the recommendations.
- . Attachment 2 contains the recommendations and the reasons for the recommendations of the working group.
- . Attachment 3 provides samples of single event noise profiles and noise contours for the recommended procedures with various aircraft types and engine combinations.
- . Attachment 4 contains copies of the written comments on the FAA's initial proposal and counter proposals which are submitted by industry. The last document of this attachment is a copy of the FAA's initial proposal.
- . Attachment 5 contains copies of the results of certain noise abatement departure profile tests conducted by the working group.

**OVERALL NOISE RELIEF BENEFITS:** The current Advisory Circular 91-53, Noise Abatement Profile, provides for only one standard noise abatement departure profile. This procedure is equivalent to the "distant procedure" recommended by the working group. The working group recommendations include two standard procedures, one of which provides relief for noise sensitive areas relatively close to the end of the runway, and the other, relief for noise sensitive areas that are more distant from the runway end. The recommendations also provide for deeper thrust cutbacks for aircraft with high bypass ratio engines. Current AC 91-53 provides for only a reduction to normal climb thrust with high bypass engines.

**RECOMMENDATIONS:** The working group's recommendations and reasons for those recommendations are in Attachment 2 of this report. In summary the working group recommends the following:

- . That two basic (standard) noise abatement procedures, a close-in and a distant procedure, be adopted for nationwide use. The appropriate procedure for a particular situation depends on operating gross weights, runway lengths, and locations of the noise sensitive area.
- . That the criteria established for noise abatement procedures be applicable to all types of turbojet aircraft over 75,000 pounds.
- . That the minimum altitude for initiating the procedure should not be less than 800 feet above field elevation (AFE).
- . That for aircraft without automatic thrust cutback and restoration systems, the cutback thrust should not be less than that necessary to maintain the engine-inoperative climb gradients specified by FAR 25.111(c) (3).
- . That for aircraft with automatic thrust cutback and restoration systems, the cutback thrust should not be less than that necessary to maintain an engine-inoperative climb gradient of at least 0% if the automatic thrust restoration system failed to function properly.
- . That the noise abatement thrust reduction be maintained until at least 3,000 feet AFE or until past the noise sensitive area.
- . That these criteria for the two noise abatement procedures be made mandatory through operations specifications.

**MAINTENANCE OF ADEQUATE SAFETY LEVELS:** The following elements of the recommendations ensure that adequate levels of safety are maintained.

- . The requirement for only two basic procedures that are applicable to all types of turbojet aircraft provides for standardization of operational procedures and flightcrew training and enhances retention of flightcrew proficiency.
- . The establishment of a minimum noise abatement initiating altitude of 800 feet provides for reasonable flightcrew workloads for a variety of takeoff weights and ambient temperatures as well as a safety margin (altitude) should windshear, wake turbulence or other adverse weather condition be encountered after the thrust cutback or configuration change is initiated.

The establishment of a minimum level for thrust reduction ensures a positive rate of climb in the event of an engine failure without pilot intervention (protection for insidious engine failures and other emergency scenarios). This minimum level of thrust reduction also provides sufficient thrust over drag margins to permit normal maneuvering at low airspeeds and altitudes. It also limits the amount of pitch-over during a thrust cutback thereby reducing flightcrew workloads associated with a pitch over to an acceptable level.